

## **Appendix 11.5**

# **EXISTING UTILITIES DRAWINGS**

**The Peoples Project**  
**Utilities Status Report (EIA Appendix)**

**0040026**

4 October 2019

Revision P04



Revision	Description	Issued by	Date	Checked
P01	Draft Issue for Planning	KAM	03-10-19	SM
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## Glossary

### B1.1 ABBREVIATIONS

Term	Definition
AC	Asbestos cement – pipe material for potable water main
HAUC	Highways Authorities and Utilities Committee
HPPE	High pressure polyethylene – pipe material for potable water main
HV	High voltage (electricity) above 11,000 volts
IP	Intermediate pressure gas mains operating between 2 bar and 7 bar
LP	Low pressure gas mains operating approximately between 30 mbar – 75 mbar
LV	Low voltage (electricity) up to 1,000 volts
MP	Medium pressure gas mains operating between 75mbar – 2 bar
CA	Cadent- incumbent gas utility
NRSWA	New Roads and Street Works Act (1991)
Ofcom	The Office of Communications – regulator and competition authority for the UK communications industry
Ofgem	The Office of Gas and Electricity Markets - regulator and competition authority for the UK gas and electricity markets
Ofwat	The Water Services Regulation Authority - regulator and competition authority for the privatised water and sewerage industry in England and Wales
UU	United Utilities – incumbent potable water provider
SPEN	Scottish Power Energy Networks- incumbent electricity utility
HCA	Homes and Communities Agency
EA	Environment Agency
FRA	Flood Risk Assessment
OR	Openreach
Virgin Media	VM



## B1 EXECUTIVE SUMMARY

This utilities report introduces the proposed design strategy for new and existing utilities connections for the Bramley-Moore Dock Stadium (The Peoples Project) to support the planning application submission and confirm that the proposed new infrastructure is satisfactory to serve the proposed stadium scheme.

This report to aim to describe the following:

- Establish the basis of design
- Identify the existing the infrastructure and new infrastructure requirements
- Confirm the status of utility applications
- Confirm the main incoming plant locations

## B2 INTRODUCTION

### B2.1 PURPOSE OF THE DOCUMENT

- A This report has been prepared to support of a full planning application by Everton Stadium Development Limited for the proposed development of a new stadium (52,888 seat capacity) and associated facilities and infrastructure at Bramley-Moore Dock, Liverpool (hereafter 'the site'). The report outlines the basis of the proposed design and correspondence with utility providers to date.
- B The report assesses the existing utility networks to understand required network modifications and assess capacity for electricity, gas, telecommunications and potable water. The report will also identify the anticipated utility peak demands arising from the proposed development.

### B2.2 UTILITY STRATEGY

- A An assessment has been carried out, in the form of a load profiling exercise, to understand the load requirement of the application site for the existing utility infrastructure networks. Load profiling provides an estimate of the maximum peak daily utility demand (and provides a worst case) for electricity, gas, fixed telecommunications, potable water services and drainage.
- B Utility stakeholders have been consulted in order to assess the impact of the demands on existing networks and initial feedback is that no reinforcement is required for water, gas, electricity and telecommunications
- C Utility services providers will be supplying their services from existing networks out site the sites demise the utility companies will provide distributed services into the site to serve the new stadium

### B2.3 PLANNING CONTEXT

- A There is a large amount of legislation, regulatory guidance and codes of practice that exists in connection to the utility industry that will be adhered to. The following section summarises the appropriate references.

#### B2.3.2 LEGISLATION, REGULATORY GUIDANCE AND CODES OF PRACTICE

- A Each of the utility service providers are governed by the respective Act for their service and their market regulated by the appropriate services regulation authority, as detailed below:

**Table 1 Related Utility Acts and Regulators**

Utility	Act	Regulator
Electricity	Electricity Act 1989	Ofgem
Gas	Gas Act 1986 (as amended)	Ofgem
Telecommunications	Communications Act 2003	Ofcom
Potable Water	Water Act 2003	Ofwat
Foul Water Drainage	Water Industry Act 1991	Ofwat

- B The New Roads and Street Works Act (NRSWA) 1991 and The Traffic Management Act 2004 will govern any utility modifications or new installations required in the public highway.
- C Any diversionary works required will be made based on The Street Works (Recovery of Costs) Regulations whereby the utility will recover Allowable Costs for the necessary work.
- D Guidance for the utilities industry is provided by HAUC (Highway Authorities and Utilities Committee) which brings highway authorities; utilities and government together with the aim to improve working practice to reduce the impact of works on members of the public in the UK.

- a The Department for Transport and HAUC provide a number of Code of Practice Documents to assist in the planning of utility works, including:
- b Specification for the Reinstatement of Openings in Highways (Code of Practice), 2010
- c Code of Practice for the Co-ordination of Street Works and Works for Road Purposes and Related Matters, 2009
- d Practical Guide to Street Works, 2006.

E In terms of health and safety, the most relevant regulations/guidance to the application site includes;

- a Construction Design and Management Regulations 2015
- b HS (G) 47 'Avoiding Danger from Underground Services'
- c CIRIA TN95 'Proprietary Trench Support Systems'
- d CIRIA R97 'Trenching Practice'.

## B3 DESIGN PARAMETERS

### B3.1 EXTERNAL DESIGN CONDITIONS MECHANICAL SERVICES

A Location and topography:

- 1 The application site comprises Bramley-Moore Dock (BMD), on the River Mersey (centred on National Grid Reference (NGR) SJ3345292491).

### B3.2 PROJECT SPECIFIC SYSTEM OPERATING CONDITIONS

A The following clauses indicate the incoming utility services requirements for the mechanical services:

- 1 Water Supply:
  - a Peak flow rate Requirement 20 l/s
  - b Available Pressure 2 bar
  - c Incoming Pipe Size & material 180 mm
  - d Metering Details Pulse meter to BMS
- 2 Fire Fighting:
  - a Fire Fighting Flow 25 l/s
  - b Incoming Pipe Size 2 bar mm
  - c No of hydrants 12
  - d Number in simultaneous operation: 1
  - e Design Flow rate per hydrant: 25 l/s
- 3 Gas Supply:
  - a Peak Flow Rate 750 m<sup>3</sup>/hr
  - b Gas Pressure Required at Equipment 18 mbar
  - c Incoming Pipe Size & material 200 mm steel or MDPE equivalent
  - d Metering Details Pulse meter to BMS
  - e Booster required yes, for catering.(approximately 50 m<sup>3</sup>/hr)

B The following clauses indicate the design basis for the incoming electrical installations:

- 1 Total Connected Diversified Load: 6.4MVA (Estimated load)
- 2 Estimated Max Connected Load: 10.4 MVA (Connected Load)
- 3 No of incomers: 2
- 4 Maximum load per incomer: 7.5 MVA
- 5 Size and Type of incoming cables: (advised by utility company)
- 6 DNO Transformers
  - a Number of transformers: 2
  - b Load of each transformer: DNO 1 TX - 7.5MVA
  - c Load of each transformer: DNO 2 TX - 7.5MVA
  - d Overall Sizes of rooms required: 25.6 x 5.3 x 4.5 – L x W x H (Eternal dimensions)
  - e Size of Rooms required: 6 x 5 x 4 – L x W x H (Internal dimensions)
  - f Size of Rooms required: 6 x 5 x 4 – L x W x H (Internal dimensions)
  - g Size of Room switch room: 13 x 5 x 4 – L x W x H (Internal dimensions)
  - h Room detail: bunded to 1.5m
  - i Room Ventilation Requirements: Natural Ventilation
  - j Room Fire rating requirements 2 hr 00min TBC by SP Energy Networks
- 7 Type of metering 33/11kV
- 8 Earthing System (TBC by SP Energy Networks)
- 9 Ze (TBC by SP Energy Networks)
- 10 Client Transformers
  - a Number of transformers: 4

b	Load of each transformer:	TX1 North West 2.5 MVA
c	Load of each transformer:	TX2 North East 2.5 MVA
d	Load of each transformer:	TX3 South East 2.5 MVA
e	Load of each transformer:	TX4 South West 2.5 MVA
f	Sizes of Rooms required	5 x 5 x 4 – L x W x H
g	Room detail:	n/a
h	Room Ventilation Requirements	Natural Ventilation
i	Room Fire rating requirements	2 hr 00min
11	Type of metering	11kV or 400V
12	Earthing System	(TBC by SP Energy Networks)
13	Ze	(TBC by SP Energy Networks)
14	Construction/OB Transformers by DNO	
a	Number of transformers:	2
b	Load of each transformer:	1 MVA
c	Sizes of Rooms required:	6 x 4 x 3 – L x W x H
d	Room detail:	bunded to 1.5m
e	Room Ventilation Requirements	Natural Ventilation
f	Room Fire rating requirements	2 hr (advised by utility company)
15	Type of metering	11kV or 400V
16	Earthing System	(advised by utility company)
17	Ze	(advised by Utility Company)

### **B3.3 INTERNAL DESIGN PARAMETERS SERVICES**

A The internal design parameters are indicated on the following schedules for each area of the building:

## B4 MAINS GAS SUPPLY

### B4.1 BASIS OF DESIGN

- A Gas load-profiling estimates the peak gas demand for the application site and hence determines the gas infrastructure required. The load profiling exercise is based on baseline figures from industry guidance and BuroHappold Engineering experience from similar development proposals for stadiums.
- B The following table summarises the peak gas load for the application site.

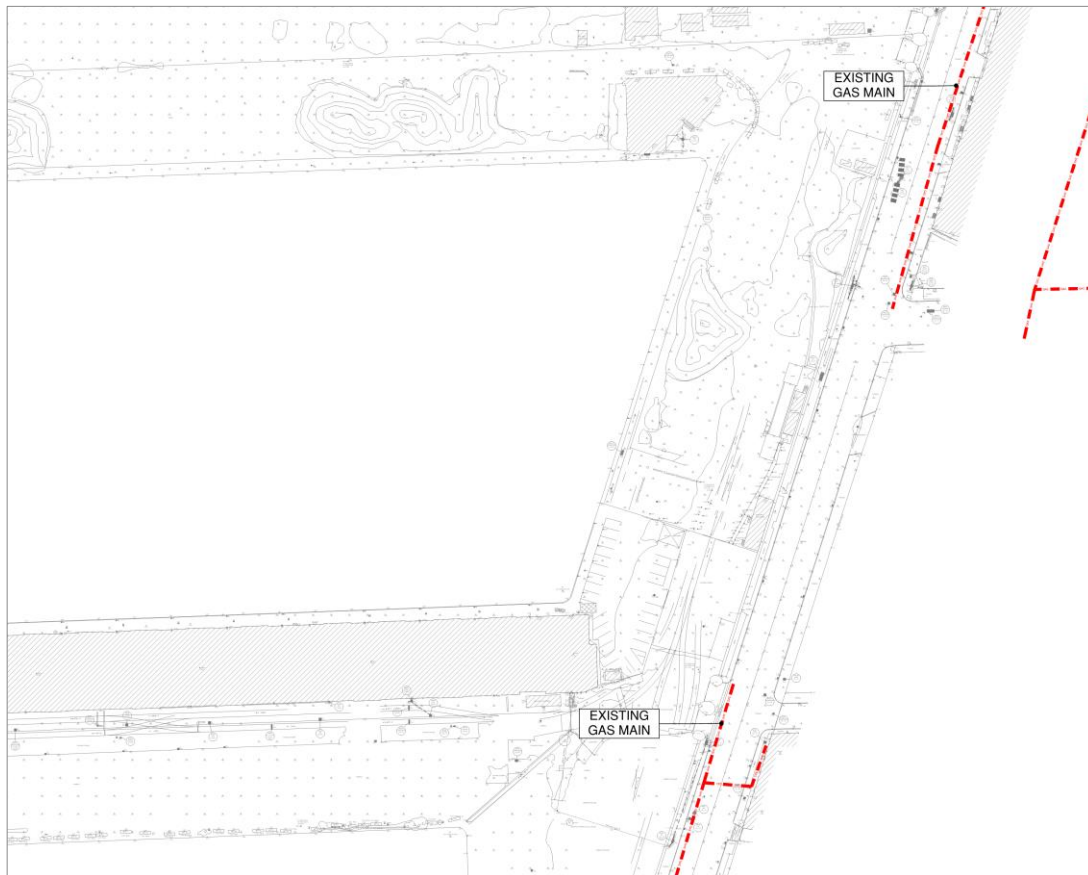
**Table 2 Peak Gas demand for application site**

Utility Break-down	Maximum Hourly Load	Annual Load
Heating and hot water load (Including Pitch Heating)	5,500 kW	879,767 kWh
Catering	2,000 kW	280,028 kWh
Total	7,500 kW	1,159,795 kWh
Total Flow (Peak)	698 m <sup>3</sup> /hr	

- C A new gas supply is to be brought into the site by the gas provider company (Cadent) and terminated in a meter room located (Level 0 North stand).
- D The gas demand for catering use has been based on the catering information received on the 9<sup>th</sup> of June 2019 by the projects catering consultants, Tricon, and estimates for the concessions gas load, which are based on the final scheme submitted for planning. When the final kitchen layouts and requirements have been confirmed and a updated connected load will be submitted to Cadent with the final application

### B4.2 EXISTING INFRASTRUCTURE

- A Cadent is the distribution network company for the Liverpool area. The initial utility enquiry confirmed the existing LP distribution network was located to the northeast corner of the site.
- B Having provided Cadent with estimates of gas loads they have confirm adequate capacity in the local network to provide a low-pressure supply to the site without requirement for additional reinforcement of distribution network.



**Figure 1 Existing gas infrastructure**

### **B4.3 STATUS OF UTILITY APPLICATION**

- A In December 2017, a preliminary application quote was obtained for the gas supply based on the requirements outlined in section B4.1, Figure 2 Table of information supplied / received from Cadent. Since the 2017 application we have remained in contact with Cadent, they are aware of the application proposal and the gas load estimates for the current scheme.

**Table 3 Peak gas demand for application site**

Item	Information supplied / received
Peak Flow Rate	698 m <sup>3</sup> /hr Final application to be amended once catering loads are confirmed
Gas Pressure at connection	23 mbar
Incoming Pipe Size & material	200 mm steel or MDPE equivalent
Metering Details	Pulse meter to BEMS.
Booster Required	Yes, for catering gas distribution
Utility Contact details:	Cadent Gas Limited North West Network Connections Business Services PO BOX 7084

	Wolverhampton WV1 9AW Tel:0800 074 5788
Quotation reference:	Quotation Ref: 32856152

**B4.4 PLANT LOCATIONS**

A The incoming gas meter room and gas booster room are located in the North East corner of the stadium, from which gas is distributed to the level 1 boiler room and kitchens.

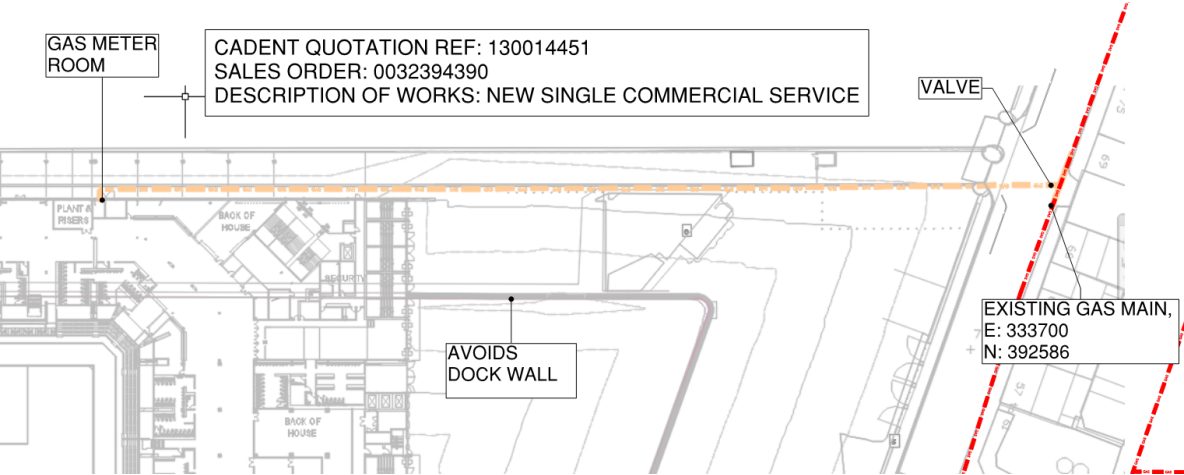


Figure 3 Local connection point drawing from Cadent

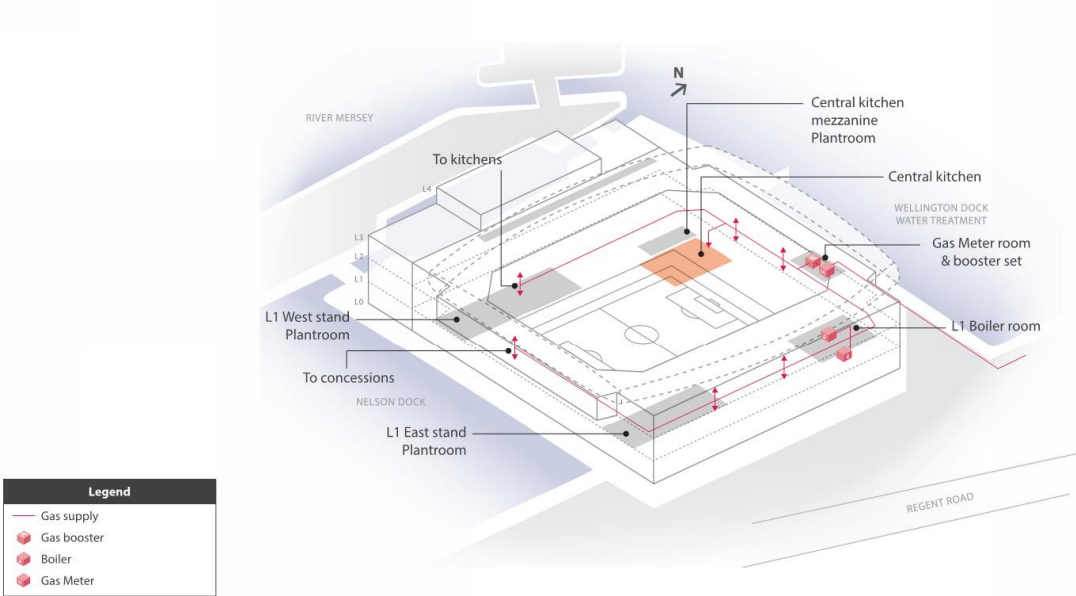
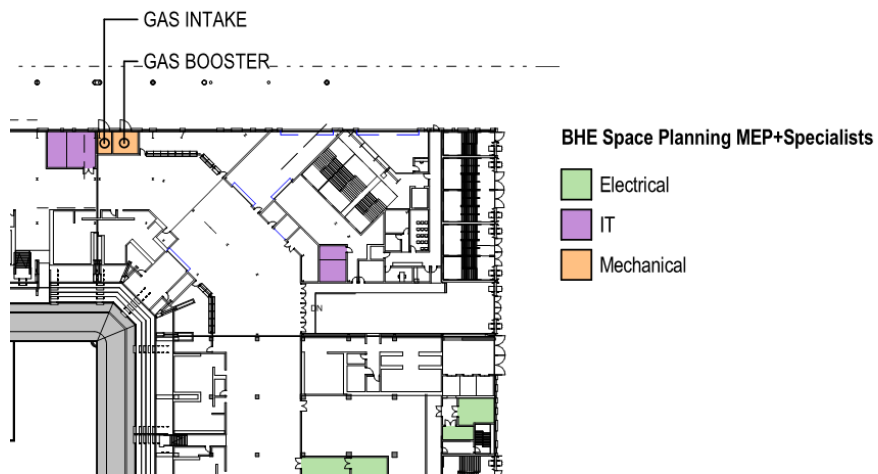


Figure 4 Local connection point drawing





**Figure 5 Location of gas intake and booster rooms**

## B5 MAINS WATER SUPPLY

### B5.1 BASIS OF DESIGN

- A Water load profiling estimates the peak water demand for the application site and this hence determines the infrastructure required. The load profiling exercise is based on baseline figures from industry guidance and BuroHappold Engineering experience from similar development proposals.
- B The peak water load has been based on a refill time of 4 hours for a 270, 000 litre potable water tank.
- C For firefighting, a flow of 25l/s is required assuming only 1 hydrant will be used at any given time. However, the hydrant water will connect to a total of 12 hydrants.

### B5.2 EXISTING INFRASTRUCTURE

- A United Utilities is the distribution network company for the Liverpool area. The initial utility enquiry confirmed an existing water main around the South and East of the site. See Figure 6 for further details.

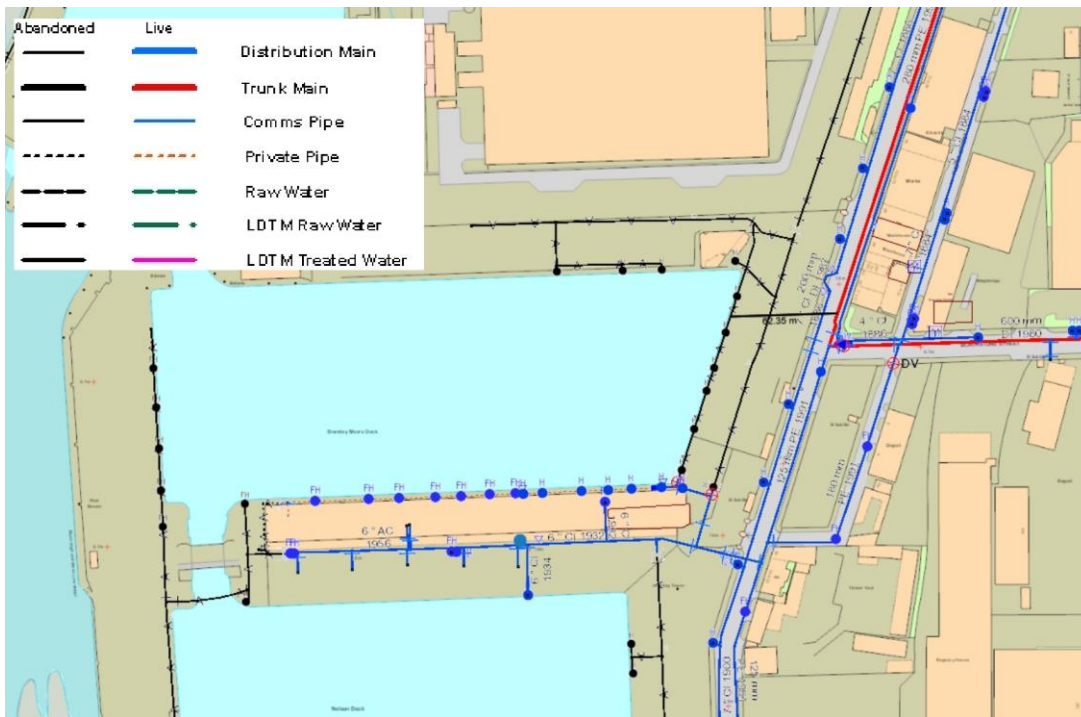


Figure 6 Existing water plans (provided by United Utilities)

#### B5.2.2 REMOVALS

From record mapping, there is abandoned water mains on the North of the site, which needs removing to accommodate the construction of the stadium above. In addition, there is existing hydrant main serving the south dock wall that will be isolated and removed.

### B5.3 STATUS OF UTILITY APPLICATION

A preliminary application has been made for the proposed scheme's incoming water supply based on the following:

**Table 4 Peak Water Demand for Application Site**

Item	Information
Peak Flow Rate Stadium	20 l/s
Peak Flow Rate Hydrant Ring Main	25 l/s (Single Hydrant Operation)
Existing Incoming Mains Water Pressure	1.5 bar
Incoming Pipe Size & material	125 mm MDPE equivalent
Metering Details	Pulse meter to BEMS.
Booster Required	Yes, downstream of water storage tank
Utility Contact details:	United Utilities Water Limited Metering Connections Windmer House : Lingley Mere Business Park Lingley Green Avenue Warrington WA5 3LP Marie Wood, Tel: 03450726067, DeveloperServicesWater@uupic.co.uk
Quotation reference:	4100285527

### B5.4 PLANT LOCATIONS

The incoming water meter located in the South East corner of the site, where it connects to the potable water tank.

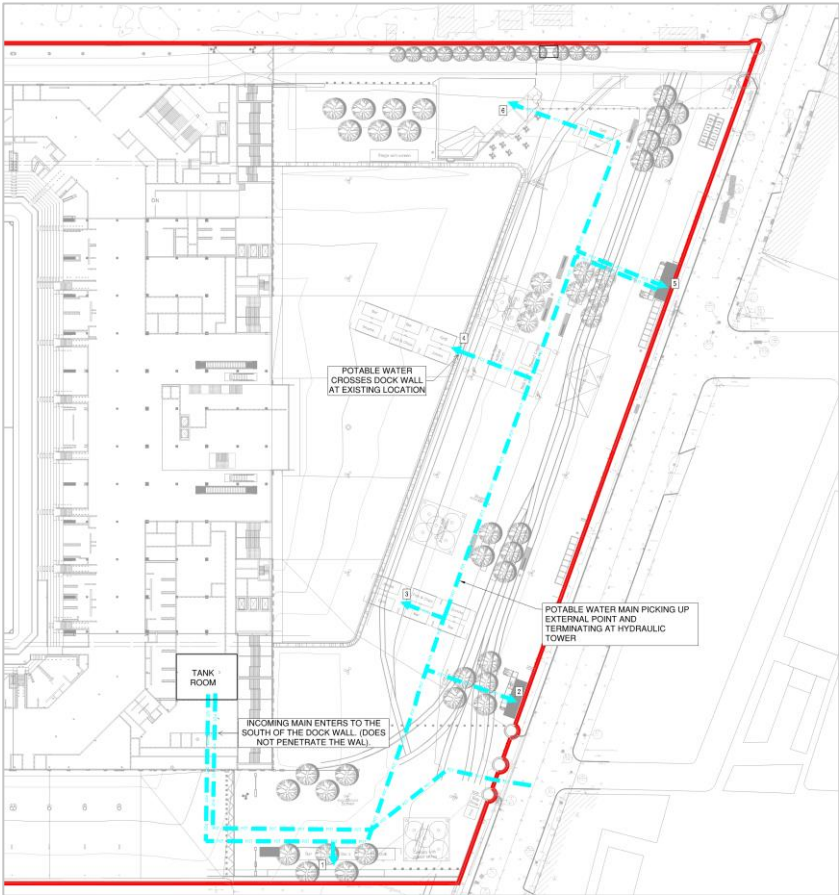


Figure 7 Incoming water mains route

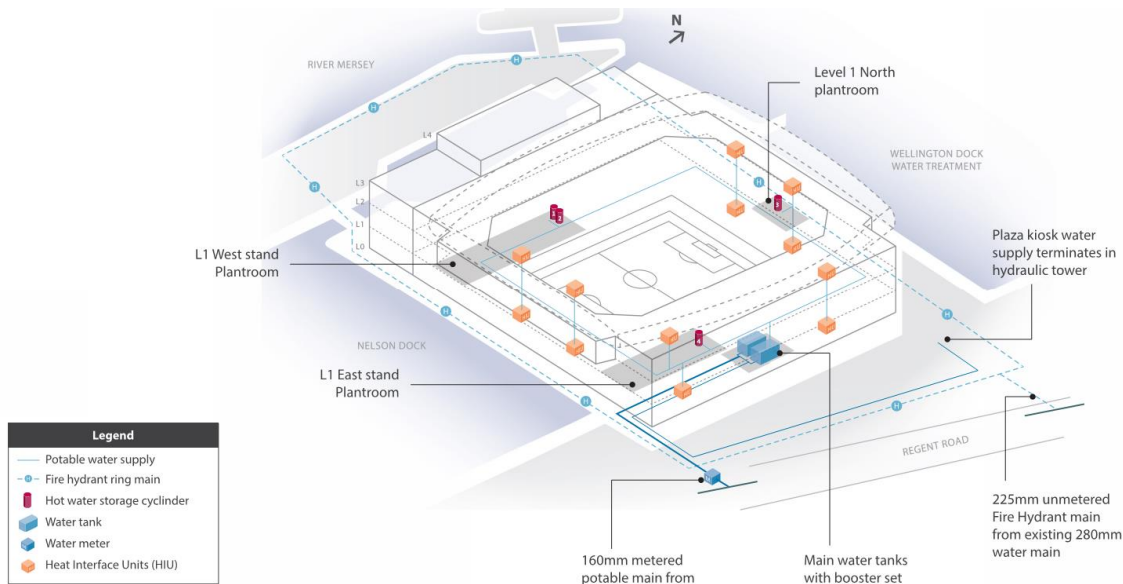


Figure 8 New potable mains water supply

## B6 MAINS ELECTRICAL SUPPLY

### B6.1 BASIS OF DESIGN

- A The supply and distribution strategy has to be capable of supporting the entire development. We have utilised the plans and area schedule for the fixed planning scheme to inform our load estimates. Where applicable, loads were established from previous experience of stadia projects and recent survey reports of the existing conditions, post occupancy evaluation and from BSRIA & CIBSE Best Practice guides.
- B The specialist technology loads have been based upon BuroHappold post occupancy evaluation of various stadia in order to determine typical performance and general electrical loads. The following dashboard illustrates the load across the site and summarises the diversified electrical loads for the stadium.

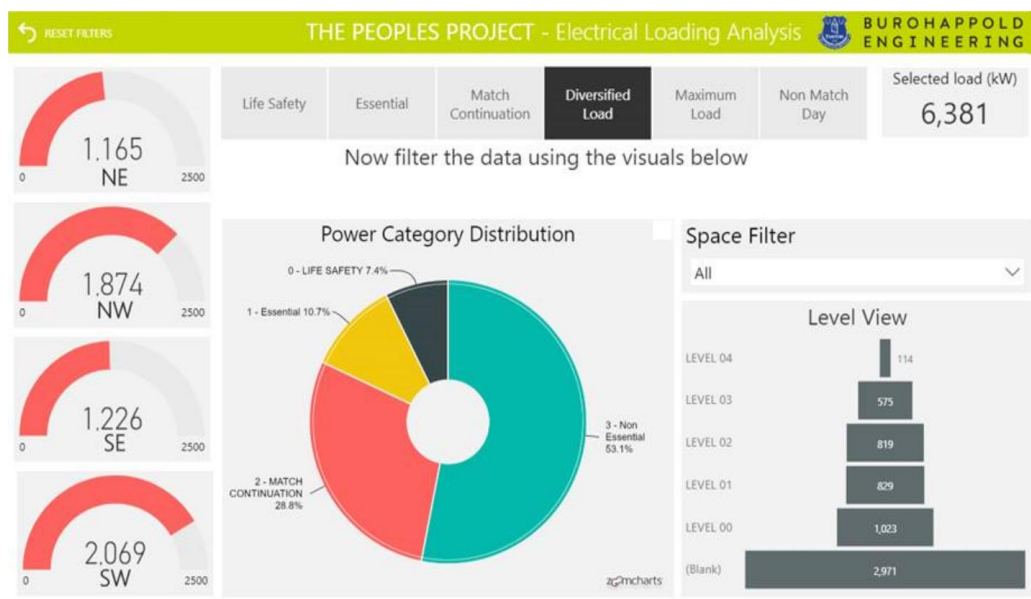


Figure 2 Diversified load calculation

### B6.2 EXISTING INFRASTRUCTURE

- A SPEN Scottish Power Energy Networks is the distribution network operator (DNO) for the Liverpool area. In this instance the Bramley Moore Dock is managed by Peel Ports and was previously owned and operated by The Mersey Docks & Harbour Company. As the Bramley Moore Dock has inherently functioned as a private site, with it operating with its own independent/private HV/LV network. Due to this arrangement record information has been difficult to obtain.
- B A GPR survey has been undertaken and has identified existing electrical services that run across the site.
- C Further investigation and verification will be arranged prior to the removal of redundant existing services that are not required for the development of the proposed stadium.

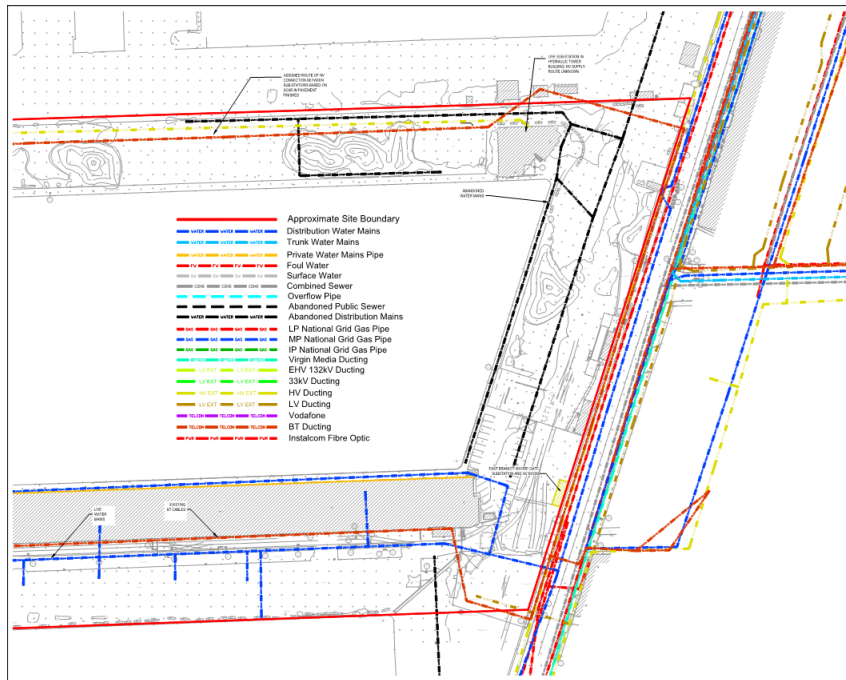
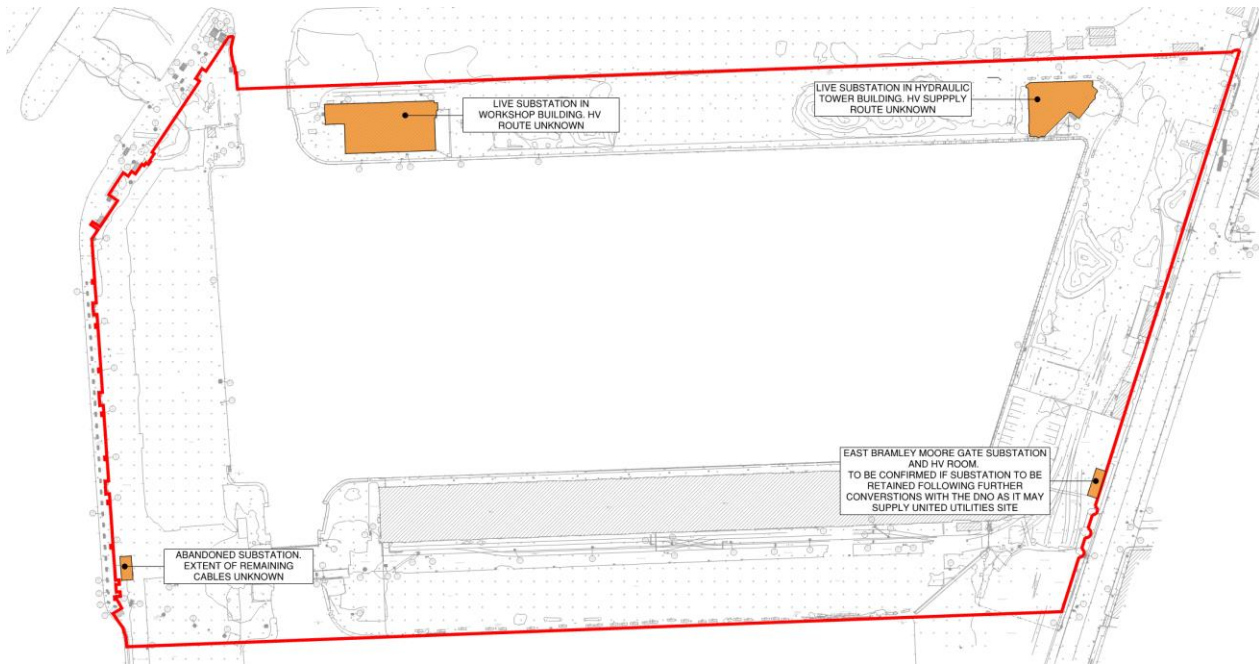


Figure 9 Existing below ground services (east)



Figure 10 Existing below ground services (west)





**Figure 11 Location of existing substations**

- D The DNO has confirmed that there is currently no spare capacity within the current 11kV network that runs along Regents Road to accommodate the new stadium and associated development. However, the limited spare capacity will be utilised initially for construction equipment and accommodation. Post completion this will provide the permanent solution for the dedicated supply to the OB compound and associated welfare facilities.
- E A new supply to will be arranged by the DNO from the local 33kV network and will provide the operational power needed to run the stadium.

### **B6.2.2 REMOVALS**

From record mapping, there is redundant private electricity infrastructure identified that served the docks previously. This will require removal prior to construction.

<b>Substation / Service head</b>	<b>Location</b>	<b>Action</b>
North West Substation and Header	North West office building	LIVE Substation within building to be isolated and removed including header
North East Substation and Header	North East within Hydraulic tower	LIVE Substation within Hydraulic Tower to be isolated and removed
South East Substation and Header	South East Grade II Listed adjacent Regent Road wall	LIVE Substation Within existing building to be isolated and removed
South East Substation	South East Svitzer Warehouse	LIVE header into Svitzer building to be isolated and removed
South West Substation	South East isolation structure	DEAD (de-energised) Substation within old substation enclosure to be stripped out and removed

### B6.3 STATUS OF UTILITY APPLICATION

A preliminary application has been made for the stadium's incoming supply based on the following:

**Table 5 Status of electrical utility application**

Item	Information
Incoming electrical supply 1	MV DNO 33kV network (DNO TX1)
Incoming electrical supply 2	MV DNO 33kV network (DNO TX2)
Incoming electrical supply 3	MV DNO 11kV network (Temporary site supply and permanent OB supply)
Metering Details	Metered at 11kv Pulse meter .
G99 Connection	TBC
Utility Contact details:	Alastair Oldfield SP Energy Networks  Lister Drive Tuebrook Liverpool L13 7HJ 01416149947 Ext.60185
Quotation reference:	Stadium Supply [#250199#10065339#]
Quotation reference:	Temporary site supply and permanent OB supply [#613823866#10065339#]

### B6.4 PLANT LOCATIONS

- A Based on the load profiling exercise, it is anticipated that the DNO will provide two 33/11kV Substations in order to serve the stadium demands.
- B The DNO will arrange for a two new independent 33kV connections of which will be taken from separate 132kV grid sites as follows.
  - 1 Bootle 132kV Grid
  - 2 Burlington St 132kV Grid
- C The point of connection will be made at Great Howard Street for both independent 33kV supplies. The 33kV network would enter the site from South East entrance and route its way to the west quay. The DNO would terminate the 33kV network cables into two dedicated substation compound.
- D The substation compound would house two 33/11kV step down transformers, a 7 way 33kV panel board and multi way outgoing panel to serve the stadium demands.
- E A RMU will be provided to enable both feeds to provide full site load on each transformer.
- F The equipment of the electric substation (switch rooms and transformers) is protected from flooding. It is raised internally above the DFL to avoid damage during the Design Flood Event.



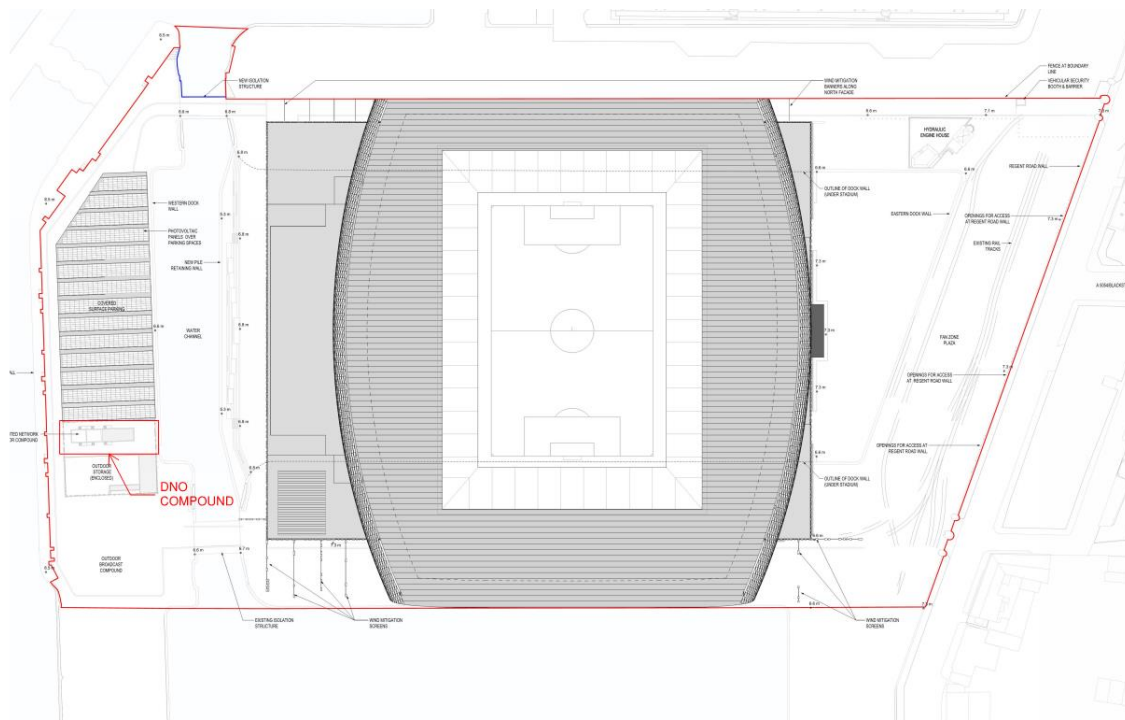


Figure 12 Location of new DNO compound

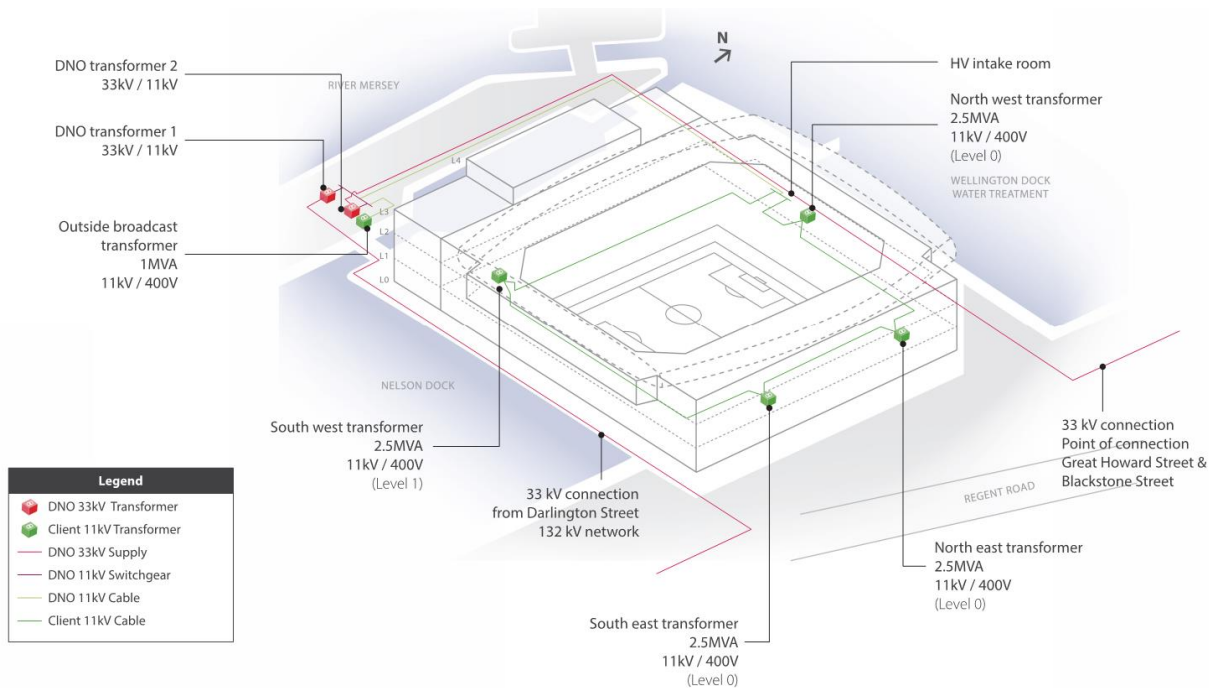


Figure 13 New incoming HV services concept

## B7 TELECOMMUNICATIONS

### B7.1 BASIS OF DESIGN

A The Stadium will have two entry points for telecommunications, one to the North of the site and the other to the South. We propose two banks of 12 ducts, possibly with four dedicated ducts and chambers for BT Openreach, and shared duct bank and chambers for any other operators (note the preference is for unified communications chambers). The diverse routes will allow for resilient telecommunications services, including potential for managed diversity to separate local exchanges. The telecommunications services to the site should provide for:

- 1 Connectivity for local authorities (e.g. CCTV monitoring)
- 2 Connectivity for the client (wide area network, internet, telephony)
- 3 Connectivity for tenants
- 4 Connectivity for public internet
- 5 Connectivity for mobile operator(s)
- 6 Connectivity for broadcasters

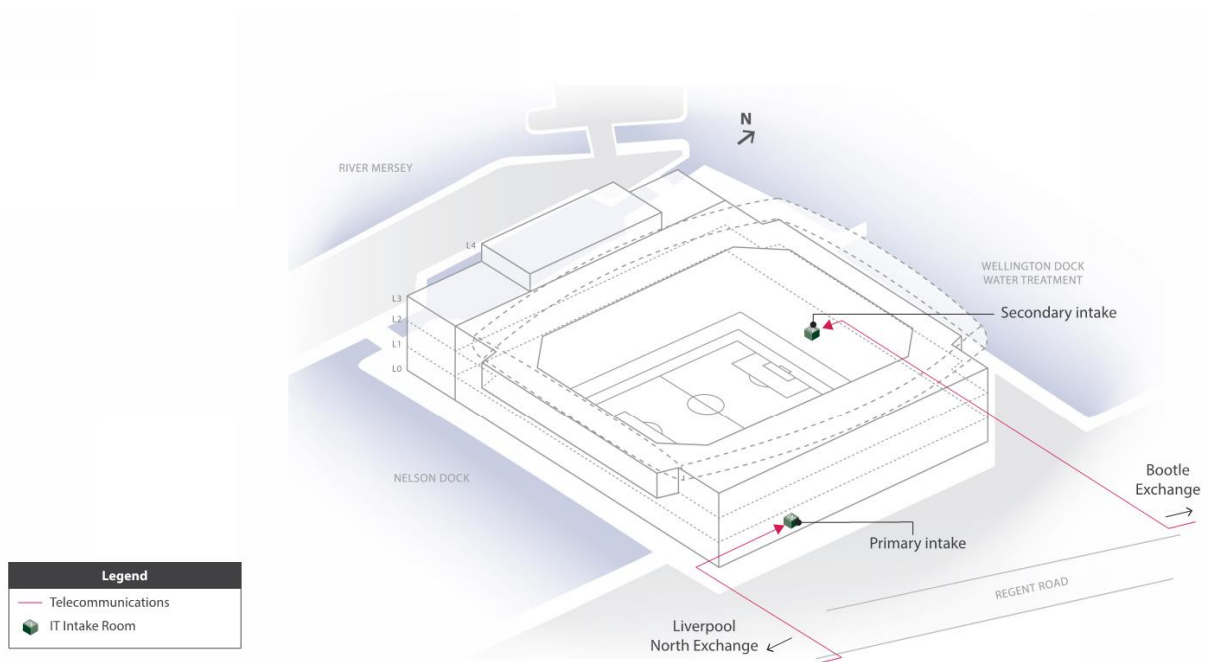
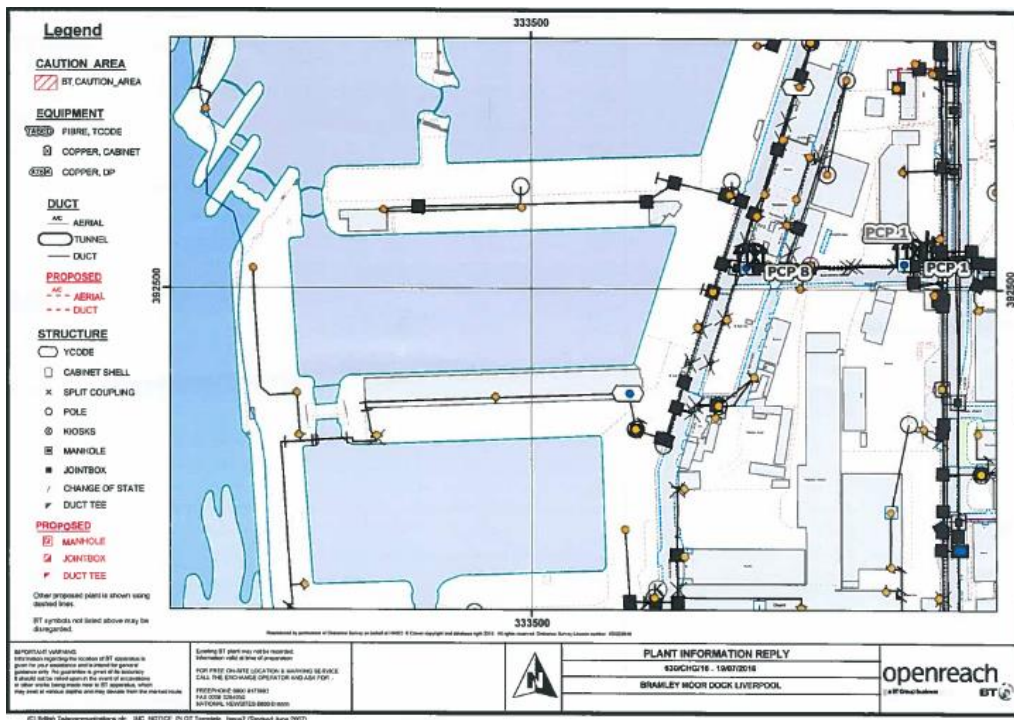


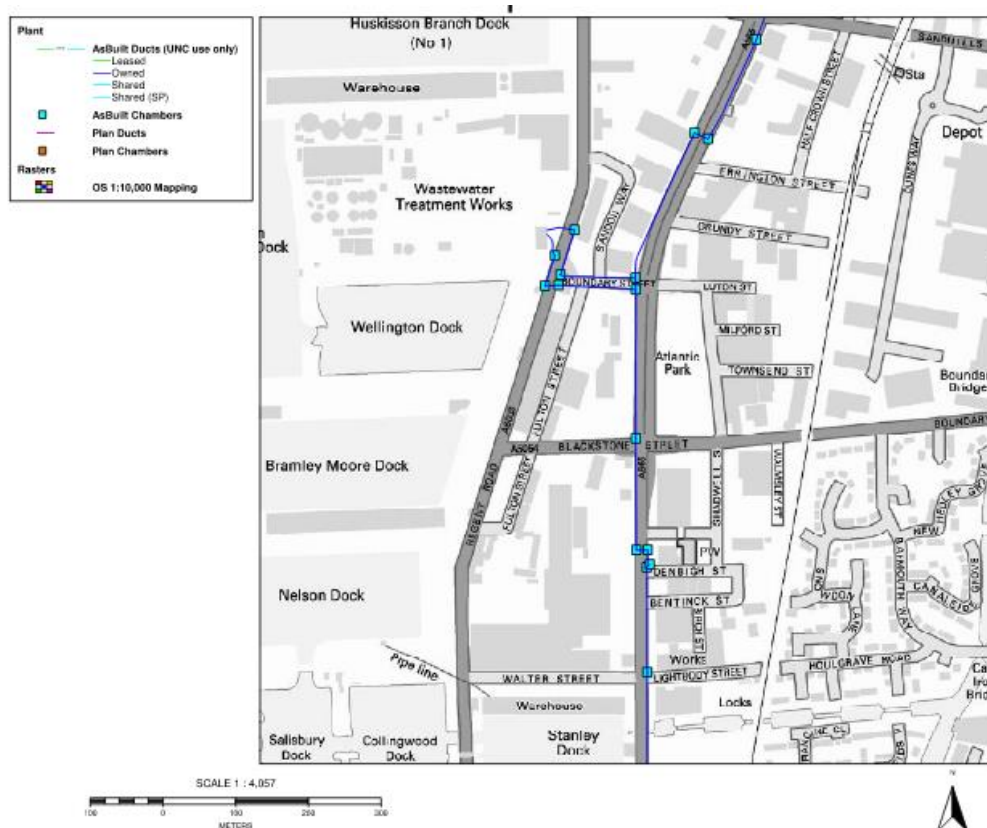
Figure 14 Incoming telecommunications services

### B7.2 EXISTING INFRASTRUCTURE

- A Our desktop utilities search (BMD01-BHE-ZX-XX-SU-Y-9001), highlights that the following fixed telecommunications infrastructure operators are present within the vicinity of Bramley Moore Dock.
- B Wireless telecommunications infrastructure operator presence requires further investigation.



**Figure 15 Existing Openreach map**



**Figure 16 Existing Openreach map of wider area**

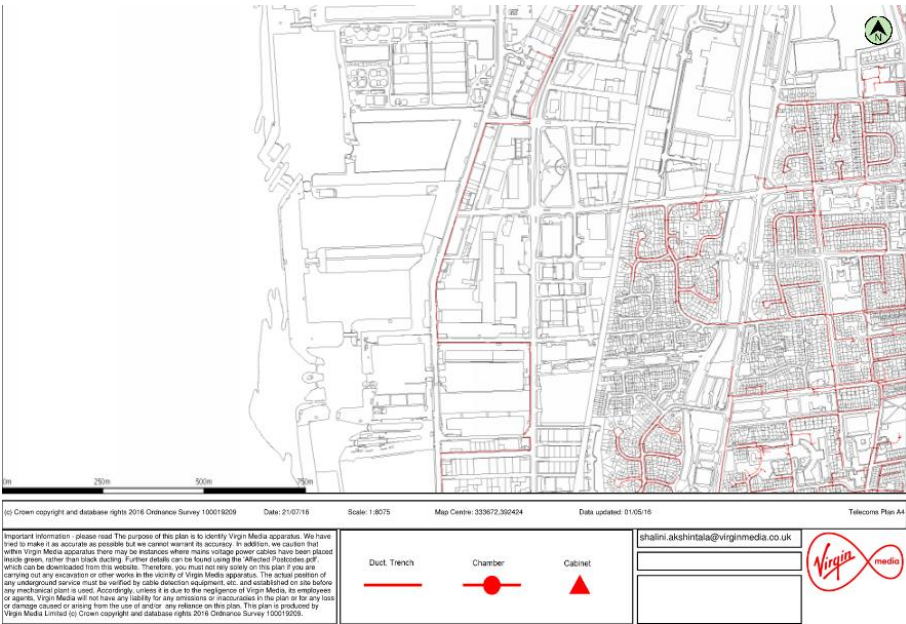


Figure 17 Existing Virgin Media map

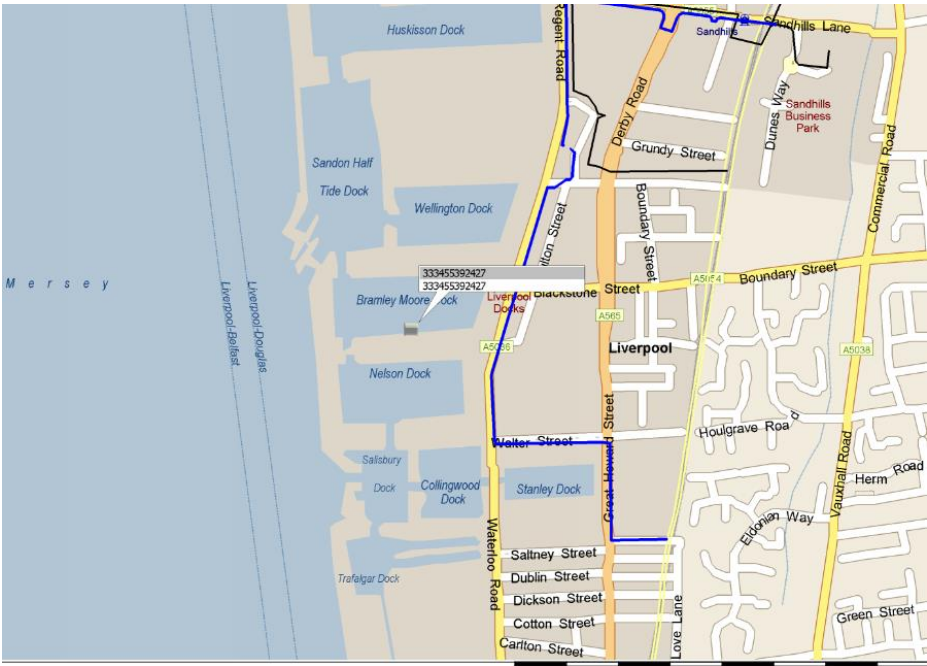


Figure 18 Existing level 3 map

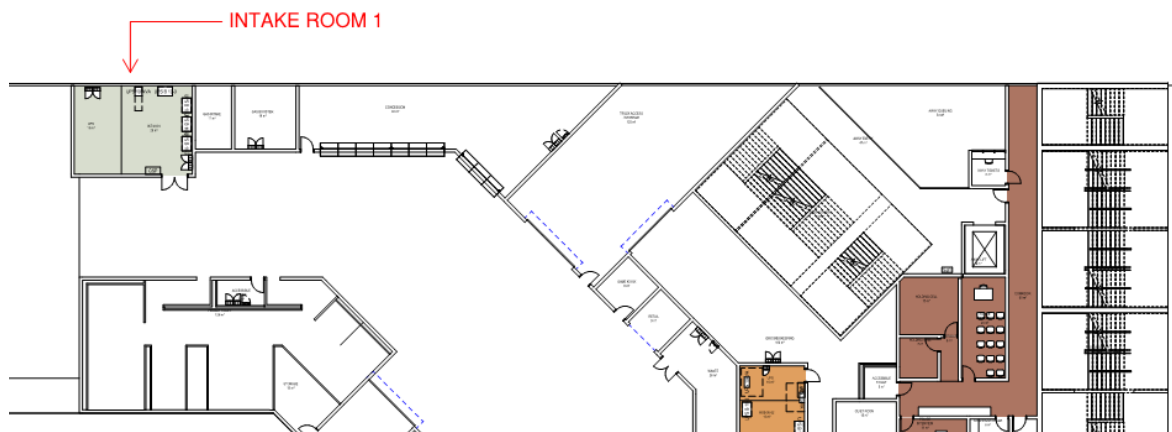


**B7.3 STATUS OF UTILITY APPLICATION**

- A Initial discussions are being held with various telecoms operators, including Openreach and Virgin Media.
- B Confirmation of existing infrastructure has been received from Openreach, confirming that telecommunications ducts enter into the site. However, further reinforcement of the Openreach infrastructure may be required to support the new development, this will be developed and confirmed through design development.
- C Confirmation of existing infrastructure has been received from Virgin Media. This indicates that they have two nearby facilities, providing confidence of good opportunities for diversity within its infrastructure. Details of further reinforcement requirements will be developed.
- D During the development of the design, confirmation of the reinforcement required will be determined with both Openreach and Virgin Media based on the confirmed bandwidth requirements that will be agreed by the operator and Everton.

**B7.4 PLANT LOCATIONS**

- A Telecommunications intake rooms are located on L00 north stand and L00 southern end of the east stand.

**Figure 19 Intake Room 1 North Stand**

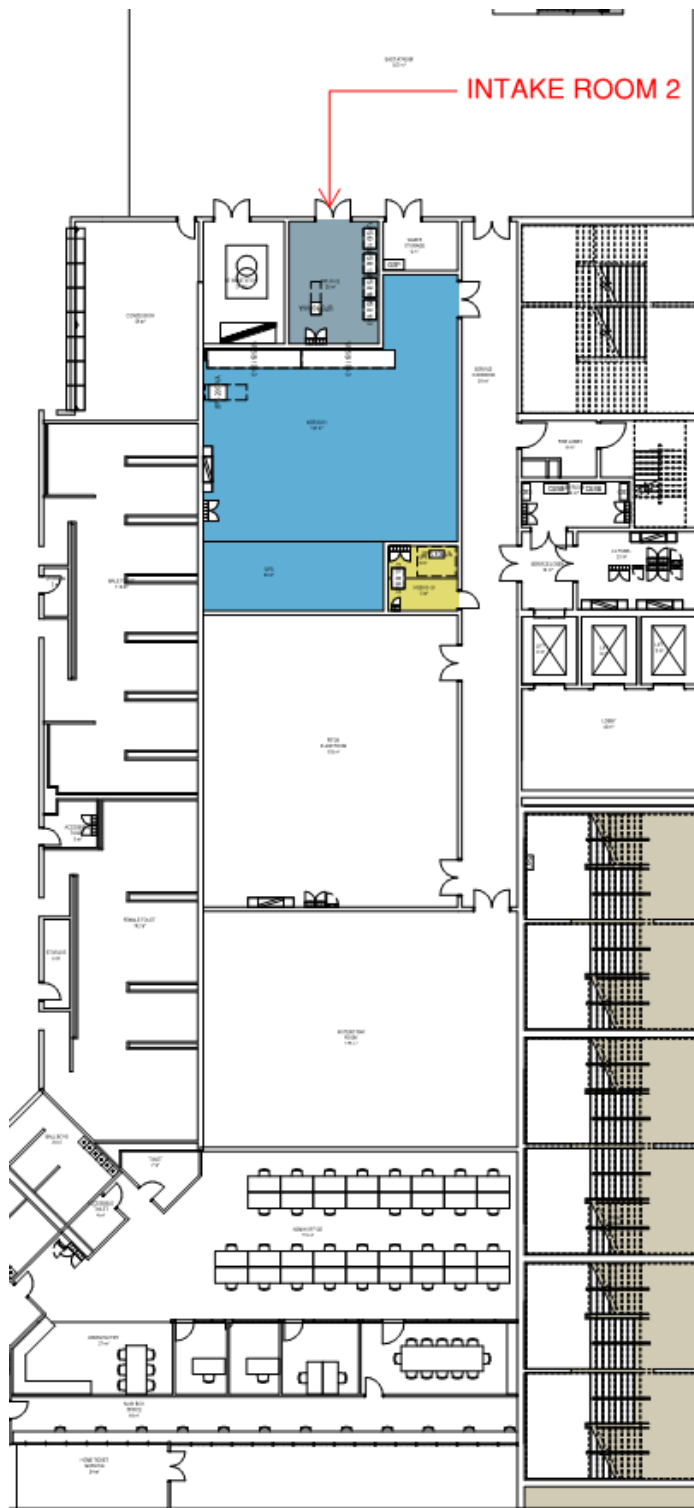


Figure 20 Intake Room 2 South East Stand



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